PLANT IMPROVEMENT & SEED PRODUCTION

PROJECT

ANNUAL REPORT FOR 1997

Activity Report for the Steering Committee Meeting n° 9

(March 1998)

ICSB / CIRAD-Forêt

Appendix 21

GUIDELINES FOR THE TREE PLANTATION INVENTORY

Dr. Roberto Bacilieri (CIRAD-Forêt), Dr. Kazuma Matsumoto (JIRCAS), Mr. Charles Garcia (ICSB)

May 1997

1.0 INTRODUCTION

These guidelines have been prepared after the decision taken during the 13° Luasong/Tawau Technical Group Meeting (May 5, 1997), to proceed with an inventory of the tree plantation in Luasong. ICSB needs to know the performances of trees in line planting in order to delineate the planting strategy for the future. This paper has as objective to underline the important elements to be included in the inventory and to optimise the procedure for the measurement and data analysis. It takes advantage of the past research experiences in Luasong (CIRAD-Forêt and ICSB: Study of the environmental effects on rattan growth; JIRCAS and ICSB: Study of the insect attacks on Meliaceae)

2.0 LIST OF COMPARTMENTS

After a survey of the existing data files in the Plantation Unit (compartment history), three major species have been identified as interesting for further planting: *Swetenia macrophylla*, *Cedrela odorata* and *Khaya ivorensis*. The list of the compartments and subblocks for each species is as follow:

1) *Swetenia macrophylla*: Compt. 218, subblocks B, C, D, E, F, G. (compt. 227 and 228?)

2) *Cedrela odorata*: Compt. 228, subblock A.

3) *Khaya ivorensis*: Compt. 230, subblocks A, B, C.

On the base of the available data, it is difficult to estimate the net planted area (sometimes the block boundaries have been moved, sometimes the block has been replanted with rattans, etc.). A first estimation, that needs to be further investigated with the help of the Plantation's Rangers, is:

1) *Swetenia macrophylla*: ~ 78 ha

2) *Cedrela odorata*: ~ 15 ha

3) *Khaya ivorensis*: ~ 53 ha

3.0 OBJECTIVES OF THE INVENTORY

It seems to us that the inventory should have two major objectives:

1) To evaluate the quality of the trees in terms of growth and form, in order to make a projection of their commercial value in the future.

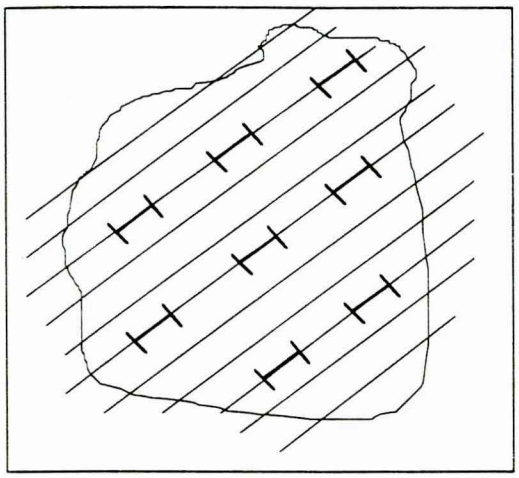
2) To describe the factors playing a role in the determination of the wood quality: insect attacks, competition from other trees, light, etc.

4.0 SAMPLING STRATEGY

We would like to suggests for the inventory to be based on non-permanent plots. One of the best sampling strategy is as follows:

Figure 1

1) Systematically draw a number of spots for each block. For example: one spot every "*X*" meters, one line over "*Y*" (Figure 1). The distance among sampling points (*X*) and/or among lines (*Y*) should be adjusted to the size of the planted subblock, in order to have enough, but not too much, sampling points for a statistical analysis. From this point of view, 80-100 spots per block should be enough.

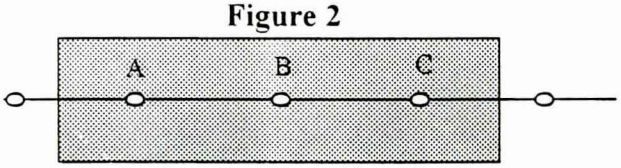


2) Once in the field, to identify the points the team must **strictly** stick to the two above parameters (*X* and *Y*), irrespective of the condition of the trees or of the forest (dead or alive, burnt or bad looking, difficult to access, etc.). All the points should be recorded and described, even if all the planted trees are dead.

3) The position (line number, spot number, distance from the road) of each point should be recorded.

Figure 2

4) One sampling point includes three (**3**) planted trees to be measured (Figure 2).



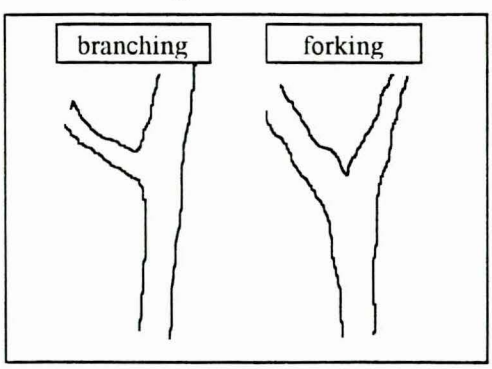
5.0 CHARACTERS TO BE MEASURED

We suggests the inventory to focus on the following measurements, to be taken, for each tree, on the main stem only:

1) Diameter at breast height.

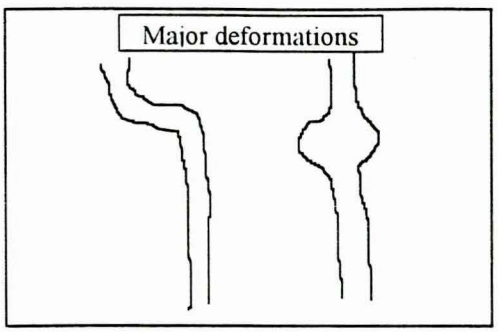
Figure 3

2) Height of branching, where branching is defined as the point of insertion of a branch with a diameter at least 25% of the diameter of the main stem at the insertion point. This includes forking, when the main stem divides in two stems of almost equal diameter, both growing out of the vertical axis (Figure 3).



3) Height of major stem deformations other than branching, that in the future can compromise the use of the log (Figure 4).

Figure 4



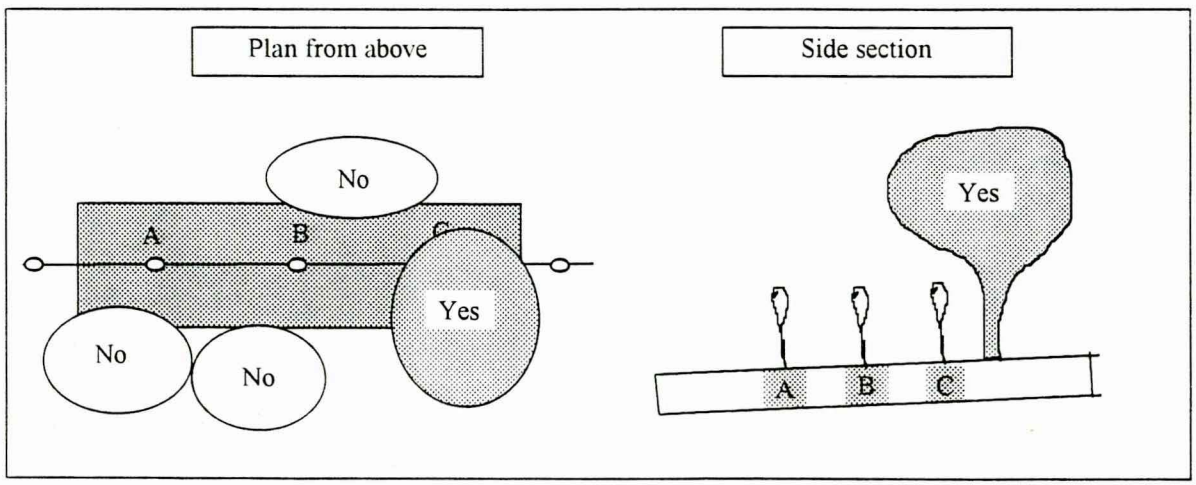
In each sampling point, the surrounding forest and environment must also be described according to the following:

1) Forest description, three classes:

a) mainly a gap
b) mainly pioneer species (record the dominant species)
c) mainly dipterocarps or other timbers (record the dominant species)

2) Each surrounding tree with the canopy overshading (above vertical) the measured tree must be counted in one of two categories: a) pioneer species; b) dipterocarps+OT (Figure 5).

Figure 5



3) Each plot should be attributed to one of the following classes

a) bottom of a valley
b) slope
c) ridge

6.0 DATA ANALYSIS

The frequency of deformations and branching can be studied according both to spatial coordinates (concentrated in few spots or evenly distributed, etc.) and to the environmental description (more deformation under heavy shade or under canopy gaps, etc.). The same applies for the analysis of growth (wet sites against dry sites; shaded against open sites, etc.). The data will be studied by the use of non-parametric statistics (non-parametric correlations, rank tests, etc.). Comparisons among species will also help to define the future planting strategy.